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10/540,561	06/24/2005	Tomonori Kondo	Q88778	6719

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EXAMINER	
SALZMAN, KOURTNEY R	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/540,561	KONDO ET AL.	
	Examiner	Art Unit	
	KOURTNEY R. SALZMAN	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed December 5, 2008 has been entered and fully considered.

2. Claims 1-25 are currently pending.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over NADANAMI et al (EP 1103807A2), in view of DIETZ et al (US 4,419,190).

NADAMANI et al teaches in paragraphs 19 and 20, a proton conductive layer contacting two electrodes with catalyst. Paragraph 26 teaches the electrodes to be in contact with an atmosphere of the measurement gas. Paragraph 28 teaches the application of voltage to each electrode.

NADAMANI et al fails to explicitly teach the voltage application to be AC.

DIETZ et al teaches a gas sensor which applies AC and DC voltage to determine a temperature sensitive composition of an analyte gas in column 1, lines 52-62. Based on the amendment to claim 1 as interpreted under 35 USC 112, 6th paragraph, the specification is consulted for the apparatus required in the "AC voltage application means". Paragraph 122 of the PG PUB of the instant application indicates the only structure required is "an AC power supply 19 for

applying AC voltage". DIETZ et al shows this power source in figure 1 as reference number 2.

At the time of invention, it would have been obvious to one of ordinary skill in the art to apply an AC voltage in the same sensor as shown in DIETZ et al to the sensor of NADANAMI et al because DIETZ et al teaches the addition of both AC and DC voltages to the sensor enabling temperature sensitive readings to be made, as stated in the abstract.

Regarding claim 2, NADANAMI et al teaches, in paragraphs 19 and 20, a proton-conductive layer contacting two electrodes with catalyst. Claim 2 teaches only the first electrode to be contacting the gas atmosphere, causing the second to not be exposed. Paragraph 28 teaches the application of voltage to each electrode and the measurement being equated to the concentration. The first electrode 3 is shielded from the gas atmosphere by the diffusion layer 6.

NADAMANI et al fails to explicitly teach the voltage application to be AC.

DIETZ et al teaches a gas sensor which applies AC voltage to determine the composition of an analyte gas in column 1, lines 52-62. Based on the amendment to claim 2 as interpreted under 35 USC 112, 6th paragraph, the specification is consulted for the apparatus required in the "AC voltage

application means". Paragraph 122 of the PG PUB of the instant application indicates the only structure required is "an AC power supply 19 for applying AC voltage". DIETZ et al shows this power source in figure 1 as reference number 2.

At the time of invention, it would have been obvious to one of ordinary skill in the art to apply an AC voltage in the same sensor as shown in DIETZ et al to the sensor of NADANAMI et al because DIETZ et al teaches the addition of both AC and DC voltages to the sensor enabling temperature sensitive readings to be made, as stated in the abstract.

Regarding claim 3, DIETZ et al teaches the apparatus of a gas sensor for the application of an AC and DC voltage, as stated in column 2, lines 46-49. Any manipulation of the apparatus required such as higher electric potential in the first electrode than the second is functional language stating an intended use and is therefore not considered in a claim to the apparatus, as long as the apparatus supplied is capable. Based on the amendment to claim 3 as interpreted under 35 USC 112, 6th paragraph, the specification is consulted for the apparatus required in the "DC voltage application means". Paragraph 138 of the PG PUB of the instant application indicates the only structure required is "a DC power source 51 for applying DC voltage". DIETZ et al shows this power source in figure 1 as reference number 1.

At the time of the invention, it would have been obvious to supply AC and DC voltage, as in DIETZ et al, to the sensor of NADANAMI et al, because it enables temperature sensitive readings to be made accurately, as stated in the abstract.

Regarding claim 4, the recitation of the amount of DC voltage to be applied is the intended operating conditions for the apparatus and supplies no structure for manipulating the power voltage to the sensor, therefore no patentable weight is given to this claim.

Regarding claim 5, NADANAMI et al teaches, in paragraphs 19 and 20, a proton-conductive layer contacting two electrodes with catalyst. Claim 2 teaches only the first electrode to be contacting the gas atmosphere, causing the second to not be exposed. Paragraph 28 teaches the application of voltage to each electrode and the measurement being equated to the concentration. As shown in figure 1, the gas enters the diffusion-rate determining portion, reference number 6, above the first electrode. The measurement chamber continues from reference number 6 to surround the electrode, as shown by the spacing to the sides of the electrode within the supports and also until meeting the proton conducting layer. Power is shown to be connected to both electrodes in figure 1.

NADANAMI et al fails to explicitly teach the application of both AC and DC voltages to the sensor.

DIETZ et al teaches a gas sensor which applies AC and DC voltage to determine the composition of an analyte gas in column 1, lines 52-62 and in column 2, lines 46-49. Based on the amendment to claim 5 as interpreted under 35 USC 112, 6th paragraph, the specification is consulted for the apparatus required in the "DC voltage application means". Paragraph 138 of the PG PUB of the instant application indicates the only structure required is "a DC power source 51 for applying DC voltage". DIETZ et al shows this power source in figure 1 as reference number 1. Based on the amendment to claim 5 as interpreted under 35 USC 112, 6th paragraph, the specification is consulted for the apparatus required in the "AC voltage application means". Paragraph 122 of the PG PUB of the instant application indicates the only structure required is "an AC power supply 19 for applying AC voltage". DIETZ et al shows this power source in figure 1 as reference number 2. Any manipulation of the apparatus required such as higher electric potential in the first electrode than the second is functional language stating an intended use and is therefore not considered in a claim to the apparatus.

At the time of the invention, it would have been obvious to supply AC and DC voltage, as in DIETZ et al, to the sensor of NADANAMI et al, because it enables temperature sensitive readings to be made accurately, as stated in the abstract.

Regarding claim 6, NADANAMI et al teaches, in paragraphs 19 and 20, a proton-conductive layer contacting two electrodes with catalyst. NADANAMI, claim 2 teaches only the first electrode to be contacting the gas atmosphere, causing the second to not be exposed. Paragraph 28 teaches the application of voltage to each electrode and the measurement being equated to the concentration. As shown in figure 1, the gas enters the diffusion-rate determining portion, reference number 6, above the first electrode. The measurement chamber continues from reference number 6 to surround the electrode, as shown by the spacing to the sides of the electrode within the supports and also until meeting the proton conducting layer. Power is shown to be connected to both electrodes in figure 1. Figure 8 shows the addition of a reference electrode, reference number 5, also in contact with the proton conduction layer 2, as described in paragraph 53.

DIETZ et al teaches the apparatus of a gas sensor for the application of an AC and DC currents, as stated in column 1, lines 52-62 and in column 2, lines 46-49. Based on the amendment to claim 6 as interpreted under 35 USC 112, 6th paragraph, the specification is consulted for the apparatus required in the "DC voltage application means". Paragraph 138 of the PG PUB of the instant application indicates the only structure required is "a DC power source 51 for applying DC voltage". DIETZ et al shows this power source in figure 1 as reference number 1. Based on the amendment to claim 6 as interpreted under 35 USC 112, 6th paragraph, the specification is consulted for the apparatus

required in the "AC voltage application means". Paragraph 122 of the PG PUB of the instant application indicates the only structure required is "an AC power supply 19 for applying AC voltage". DIETZ et al shows this power source in figure 1 as reference number 2. . The use of these current applications in operational steps, such as for determining concentration or pumping hydrogen is functional language stating an intended use and is therefore not considered in a claim to apparatus.

At the time of invention, it would have been obvious to one of ordinary skill in the art to apply a DC and AC voltage in the same sensor as shown in DIETZ et al to the sensor of NADANAMI et al because DIETZ et al teaches the addition of both voltages to the sensor enables temperature sensitive readings to be made, as stated in the abstract.

Regarding claim 7, in conjunction with the previous rejection of 6, it would have been obvious to one of ordinary skill in the art to have the second electrode function as a reference electrode, causing a two electrode sensor system, which is well known in the art.

Regarding claim 8, in conjunction with the previous rejections of claims 6, figure 8 shows the connection of the reference electrode and the first electrode via lines through voltmeter 10. However, the oxidation potential measurement is

functional language stating an intended use and is therefore not considered in a claim to apparatus.

Regarding claim 9, in conjunction with the previous rejection of claims 6 and 8, the potential measurement is functional language stating an intended use and is therefore not considered in a claim to apparatus.

Regarding claim 10, in conjunction with the previous rejection of claim 5, the connection of the AC and DC voltage is shown to be applied to the sensor, and in turn two electrodes, as shown in DIETZ et al figure 1. However, the use of the potential measurement is functional language stating an intended use and is therefore not considered in a claim to apparatus.

Regarding claims 11-16, in conjunction with the previous rejections of claims 5 and 10, the oxidation voltage and limits of voltage application values are functional language stating an intended use and are therefore not considered in a claim to apparatus.

Regarding claim 17, in conjunction with the previous rejection of claim 5, paragraph 40 of NADANAMI et al teaches the Pt catalyst of the electrodes to decrease carbon monoxide in the analysis gas.

Regarding claims 18-22, in conjunction with the previous rejection of claim 1, the manipulation of the frequencies to arrive at impedances or the use of waveforms in operation to determine current is intended us of the AC voltage application and is therefore not considered in a claim to apparatus.

Regarding claims 23 and 25, in conjunction with the previous rejection of claim 1, paragraph 40 of NADANAMI et al teaches the Pt catalyst of the electrodes to decrease carbon monoxide in the analysis gas.

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over NADANAMI et al (EP 1103807 A2) and DIETZ et al (US 4,419,190), in view of GOPAL (US 6,602,630).

NADANAMI et al teaches all the limitations of claim 1. NADANAMI et al fails to teach the density of the platinum catalyst present on the electrode.

GOPAL teaches an electrode assembly with catalyst loading or area density of 1 to 5 mg/cm^2, in column 9, lines 15-22.

At the time of invention, it would have been obvious to use a platinum catalyst electrode loaded at 1 to mg/cm2 as in GOPAL as the electrode of NADANAMI et al because it would be optimize the loading of the catalyst according to the desired degree of purification and adsorption, as stated in GOPAL column 9, lines 15-19.

Response to Arguments

6. The combination of NADANAMI et al and DIETZ et al has been applied to claims 1 and 2 in response to the amendments to the claims.

7. Applicant argues on page 10 that DIETZ et al teaches a different type of gas sensor, one of a solid electrolyte-type gas sensor, than NADANAMI et al (which teaches a proton conductive layer) and is therefore inapplicable.

a. While the types of sensors are different, the same theory and method of DIETZ et al would apply to both because they are both temperature sensitive. The proton conductive layer of the instant application is said to be made of, as an example, NAFION in paragraph 117 of the instant application. MAO et al teaches in figure 1 for the conductivity of a NAFION member (CE 2) to also be temperature dependent. Because conductivity and resistance would be inversely proportional to each other, that would mean the resistance of NAFION would be also temperature dependent and the resistance detection means of DIETZ would be precisely relevant to the proton conductive layer of NADANAMI. Therefore the method of using two types of voltage to find a temperature sensitive reading would be just as applicable to a proton conductive gas sensor as a solid electrolyte sensor.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KOURTNEY R. SALZMAN whose telephone number is (571)270-5117. The examiner can normally be reached on Monday to Thursday 6:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kaj K Olsen/
Primary Examiner, Art Unit 1795

krs
3/25/2009